Practice: 449 - Irrigation Water Management

Scenario: #1 - Basic IWM 30 acres or less

Scenario Description:

A low Intensity irrigation water management system for producers using a checkbook method (crop grown, soil moisture conditions prior to irrigation, dates of irrigation start and stop, depths of irrigation applied, duration of irrigations, and amount of rainfall). For a typical scenario, soil moisture is determined by the feel method, volumes of irrigation water are based on energy or water district bills, records are kept on paper copies, and calculations are made by hand. Phaucet Program could be used where poly pipe is utilized.

Resource Concerns: Insufficient Water Supply-Inefficient use of irrigation water; Degraded Plant Condition-Undesirable plant productivity and health, and Inefficient Energy Use-Equipment and facilities.

Associated Practices: 441-Irrigation System Microirrigation, 442-Irrigation System Sprinkler, 443-Irrigation System Surface and Subsurface, 433-Irrigation Water Measurement, 434-Soil Moisture Measurement, 433- Irrigation Flow Measurement.

Before Situation:

The irrigator decides when to irrigate based on general crop or soil appearance or limited soil moisture monitoring. System run times are based on past apparent success. The typical irrigated field is a 30 acre corn field with a surface irrigation system.

After Situation:

Irrigations are scheduled based on measured crop water requirements. Records are used to evaluate results of past irrigation events and influence future irrigations. The irrigator keeps records of soil moisture, crop water use, rainfall amounts and irrigation timing and amounts. At the end of the irrigation season all the data has been reviewed and evaluated. Improvements planned for the next season have been determined.

Scenario Feature Measure: Irrigated Area Managed

Scenario Unit: Acre

Scenario Typical Size: 30

Scenario Cost: $911.52 **Scenario Cost/Unit:** $30.38

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Labor						
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	$37.98	24	$911.52

Practice: 449 - Irrigation Water Management

Scenario: #2 - Basic IWM more than 30 acres

Scenario Description:

A low Intensity irrigation water management system for producers using a checkbook method (crop grown, soil moisture conditions prior to irrigation, dates of irrigation start and stop, depths of irrigation applied, duration of irrigations, and amount of rainfall). For a typical scenario, soil moisture is determined by the feel method, volumes of irrigation water are based on energy or water district bills, records are kept on paper copies, and calculations are made by hand. Phaucet Program could be used where poly pipe is utilized.

Resource Concerns: Insufficient Water Supply-Inefficient use of irrigation water; Degraded Plant Condition-Undesirable plant productivity and health, and Inefficient Energy Use-Equipment and facilities.

Associated Practices: 441-Irrigation System Microirrigation, 442-Irrigation System Sprinkler, 443-Irrigation System Surface and Subsurface, 433-Irrigation Water Measurement, 434-Soil Moisture Measurement, 433- Irrigation Flow Measurement.

Before Situation:

The irrigator decides when to irrigate based on general crop or soil appearance or limited soil moisture monitoring. System run times are based on past apparent success. The typical irrigated field is a 125 acre corn field with a sprinkler irrigation system.

After Situation:

Irrigations are scheduled based on measured crop water requirements. Records are used to evaluate results of past irrigation events and influence future irrigations. The irrigator keeps records of soil moisture, crop water use, rainfall amounts and irrigation timing and amounts. At the end of the irrigation season all the data has been reviewed and evaluated. Improvements planned for the next season have been determined.

Scenario Feature Measure: Irrigated Area Managed

Scenario Unit: Acre

Scenario Typical Size: 125

Scenario Cost: $1,367.20 **Scenario Cost/Unit:** $10.94

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$18.98	8	$151.84
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	$37.98	32	$1,215.36

Practice: 449 - Irrigation Water Management

Scenario: #3 - Intermediate IWM 30 acres or less

Scenario Description:

A medium intensity irrigation water management system for producers using a checkbook method (crop grown, soil moisture conditions prior to irrigation, dates of irrigation start and stop, depths of irrigation applied, duration of irrigations, and amount of rainfall). The use of programs such as Phaucet or Pipe Planner for poly pipe will be use for improving of irrigation application. For a typical scenario, soil moisture is determined by in-field moisture sensors with manual downloads. Irrigation amounts are recorded from a flow meter near the pump. Records are input manually into an irrigation scheduling computer program.

Resource Concerns: Insufficient Water Supply-Inefficient use of irrigation water; Degraded Plant Condition-Undesirable plant productivity and health, and Inefficient Energy Use-Equipment and facilities.

Associated Practices: 441-Irrigation System Microirrigation, 442-Irrigation System Sprinkler, 443-Irrigation System Surface and Subsurface, 433-Irrigation Water Measurement, 434-Soil Moisture Measurement, 433- Irrigation Flow Measurement.

Before Situation:

The farmer decides when to irrigate based on general crop or soil appearance or limited soil moisture monitoring. System run times are based on past apparent success. The typical irrigated field is a 30 acre corn field with a surface irrigation system.

After Situation:

Irrigations are scheduled based on measured crop water requirements. Records are used to evaluate results of past irrigation events and influence future irrigations. The irrigator keeps records of soil moisture, crop water use, rainfall amounts and irrigation timing and amounts. At the end of the irrigation season all the data has been reviewed and evaluated. Improvements planned for the next season have been determined.

Scenario Feature Measure: Irrigated Area Managed

Scenario Unit: Acre

Scenario Typical Size: 30

Scenario Cost: $1,215.36 **Scenario Cost/Unit:** $40.51

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Labor						
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	$37.98	32	$1,215.36

Practice: 449 - Irrigation Water Management

Scenario: #4 - Intermediate IWM more than 30 acres

Scenario Description:

A medium intensity irrigation water management system for producers using a checkbook method (crop grown, soil moisture conditions prior to irrigation, dates of irrigation start and stop, depths of irrigation applied, duration of irrigations, and amount of rainfall). The use of programs such as Phaucet or Pipe Planner for poly pipe will be use for improving of irrigation application. For a typical scenario, soil moisture is determined by in field moisture sensors with manual downloads. Irrigation amounts are recorded from a flow meter near the pump. Records are input manually into an irrigation scheduling computer program.

Resource Concerns: Insufficient Water Supply-Inefficient use of irrigation water; Degraded Plant Condition-Undesirable plant productivity and health, and Inefficient Energy Use-Equipment and facilities.

Associated Practices: 441-Irrigation System Microirrigation, 442-Irrigation System Sprinkler, 443-Irrigation System Surface and Subsurface, 433-Irrigation Water Measurement, 434-Soil Moisture Measurement, 433- Irrigation Flow Measurement.

Before Situation:

The farmer decides when to irrigate based on general crop or soil appearance or limited soil moisture monitoring. System run times are based on past apparent success. The typical irrigated field is a 125 acre corn field with a sprinkler irrigation system.

After Situation:

Irrigations are scheduled based on measured crop water requirements. Records are used to evaluate results of past irrigation events and influence future irrigations.
The irrigator keeps records of soil moisture, crop water use, rainfall amounts and irrigation timing and amounts. At the end of the irrigation season all the data has been reviewed and evaluated. Improvements planned for the next season have been determined.

Scenario Feature Measure: Irrigated Area Managed

Scenario Unit: Acre

Scenario Typical Size: 125

Scenario Cost: $1,746.96 **Scenario Cost/Unit:** $13.98

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$18.98	12	$227.76
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	$37.98	40	$1,519.20

Practice: 449 - Irrigation Water Management

Scenario: #5 - Advanced IWM 30 acres or less

Scenario Description:

A high intensity irrigation water management system for producers using a checkbook method with advanced methods of determining irrigation water applied, and estimating crop evapotranspiration, monitoring field soil moisture, or monitoring crop temperature stress. The use of programs such as Phaucet or Pipe Planner for poly pipe will be use for improving of irrigation application. Typical methods include flow measurement, daily record keeping, and use of real-time evapotranspiration estimates (such as those provided dedicated weather stations) and/or soil moisture sensors with automated data logging to monitor field soil moisture content and/or crop temperature. For this scenario, soil moisture is determined by automated soil moisture monitoring stations equiped with telemetry data. Irrigation amounts are recorded from a flow meter near the pump. Telemetry data is automatically sent to a computer with irrigation software. Irrigator also receives real time data via mobile phone applications. Some data such as total water applied may be entered into computer software manually.

Resource Concerns: Insufficient Water Supply-Inefficient use of irrigation water; Degraded Plant Condition-Undesirable plant productivity and health, and Inefficient Energy Use-Equipment and facilities.

Associated Practices: 441-Irrigation System Microirrigation, 442-Irrigation System Sprinkler, 443-Irrigation System Surface and Subsurface, 433-Irrigation Water Measurement, 434-Soil Moisture Measurement, 433- Irrigation Flow Measurement.

Before Situation:

The farmer decides when to irrigate based on general crop or soil appearance or limited soil moisture monitoring. System run times are based on past apparent success.
The typical irrigated field is a 30 acre corn field with a surface irrigation system.

After Situation:

Irrigations are scheduled based on measured crop water requirements. Records are used to evaluate results of past irrigation events and influence future irrigations. The irrigator keeps records of soil moisture, crop water use, rainfall amounts and irrigation timing and amounts. At the end of the irrigation season all the data has been reviewed and evaluated. Improvements planned for the next season have been determined.

Scenario Feature Measure: Irrigated Area Managed

Scenario Unit: Acre

Scenario Typical Size: 30

Scenario Cost: $1,519.20 **Scenario Cost/Unit:** $50.64

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Labor						
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	$37.98	40	$1,519.20

Practice: 449 - Irrigation Water Management

Scenario: #6 - Advanced IWM more than 30 acres

Scenario Description:

A high intensity irrigation water management system for producers using a checkbook method with advanced methods of determining irrigation water applied, and estimating crop evapotranspiration, monitoring field soil moisture, or monitoring crop temperature stress. The use of programs such as Phaucet or Pipe Planner for poly pipe will be use for improving of irrigation application. Typical methods include flow measurement, daily record keeping, and use of real-time evapotranspiration estimates (such as those provided dedicated weather stations) and/or soil moisture sensors with automated data logging to monitor field soil moisture content and/or crop temperature. For this scenario, soil moisture is determined by automated soil moisture monitoring stations equiped with telemetry data. Irrigation amounts are recorded from a flow meter near the pump. Telemetry data is automatically sent to a computer with irrigation software. Irrigator also receives real time data via mobile phone applications. Some data such as total water applied may be entered into computer software manually.

Resource Concerns: Insufficient Water Supply-Inefficient use of irrigation water; Degraded Plant Condition-Undesirable plant productivity and health, and Inefficient Energy Use-Equipment and facilities.

Associated Practices: 441-Irrigation System Microirrigation, 442-Irrigation System Sprinkler, 443-Irrigation System Surface and Subsurface, 433-Irrigation Water Measurement, 434-Soil Moisture Measurement, 433- Irrigation Flow Measurement.

Before Situation:

The farmer decides when to irrigate based on general crop or soil appearance or limited soil moisture monitoring. System run times are based on past apparent success.
The typical irrigated field is a 125 acre corn field with sprinkler irrigation.

After Situation:

Irrigations are scheduled based on measured crop water requirements. Records are used to evaluate results of past irrigation events and influence future irrigations. The irrigator keeps records of soil moisture, crop water use, rainfall amounts and irrigation timing and amounts. At the end of the irrigation season all the data has been reviewed and evaluated. Improvements planned for the next season have been determined.

Scenario Feature Measure: Irrigated Area Managed

Scenario Unit: Acre

Scenario Typical Size: 125

Scenario Cost: $2,126.72 **Scenario Cost/Unit:** $17.01

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$18.98	16	$303.68
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	$37.98	48	$1,823.04

Practice: 449 - Irrigation Water Management

Scenario: #7 - IWM Device_YR1

Scenario Description:

This practice includes the installation of an Irrrigation Water Management device such as soil moisture sensors(tensiometers, gyp blocks, capacitance sensors etc), atmometers, water level sensors, etc, that are installed and read to determine various information to be used by the cooperator in improving irrigater management. This level of instrumentation requires manual reading. Note: flowmeter (587) and surge valve (443) are separate practices and are not to be used as an IWM device under this practice.

The installation includes the purchase of IWM device, installation of equipment, and labor to install and read sensors or device. Typical Scenario involves installation of resistance sensor blocks in a 80 acre field of irrigated cropland. In typical scenario, producer periodically monitors soil moisture sensors during the growing season. Meters used to read sensors may be portable.

Resource Concerns: Insufficient Water - Inefficient use of irrigation water, and Degraded Plant Condition - Undesirable plant productivity and health, and Inefficient Energy Use - Equipment and facilities.

Associated Practices: 449- Irrigation Water Management, 587-Structure for water Control, 328-Conservation Crop Rotation, and 590-Nutrient Management.

Before Situation:

In the typical scenario, producer uses manual methods to evaluate parameter, such as feel method to estimate soil moisture for scheduling irrigation.

After Situation:

In typical scenario, producer uses instrumentation in lieu of manual methods and has installed four sensors at each monitoring site to a depth of four feet with one sensor representing each foot of depth. Producer uses periodic soil moisture measurements to schedule irrigation resulting in improved irrigation water managment and reduced energy use.

Scenario Feature Measure: Number of Measuring Sites

Scenario Unit: Each

Scenario Typical Size: 2

Scenario Cost: $2,032.93 **Scenario Cost/Unit:** $1,016.47

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Labor						
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	$37.98	32	$1,215.36
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$18.98	8	$151.84
Materials						
Soil Moisture Meter	1455	Soil Moisture Sensor Reader. Equipment only.	Each	$266.09	1	$266.09
Soil Moisture Sensor	1456	Soil moisture resistance sensor W/10' cables. Equipment only.	Each	$34.24	8	$273.92
Mobilization						
Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	$62.86	2	$125.72

Practice: 449 - Irrigation Water Management

Scenario: #8 - IWM Device with Data Recorder_YR1

Scenario Description:

This practice includes the installation of an Irrrigation Water Management device such as soil moisture sensors(tensiometers, gyp blocks, capacitance sensors etc), atmometers, water level sensors, etc, with built-in data recording capability that are installed and read by datalogger/laptop to determine various information to be used by the cooperator in improving irrigater management. Note: flowmeter (587) and surge valve (443) are separate practices and are not to be used as an IWM device under this practice.

The practice installation includes the purchase of IWM device, installation equipment (probe or auger), and a data logger to log continuous parameter data that can be downloaded to a personal computer and associated graphing software. Typical Scenario involves installation of resistance sensor blocks in a 80 acre field of irrigated cropland. Producer periodically monitors soil moisture sensors during the growing season.

Resource Concerns: Insufficient Water - Inefficient use of irrigation water, and Degraded Plant Condition - Undesirable plant productivity and health, and Inefficient Energy Use - Equipment and facilities.

Associated Practices: 449- Irrigation Water Management, 587-Structure for water Control, 328-Conservation Crop Rotation, and 590-Nutrient Management.

Before Situation:

In the typical scenario, producer uses manual methods to evaluate parameter, such as feel method to estimate soil moisture for scheduling irrigation.

After Situation:

In typical scenario, producer uses recording instrumentation in lieu of manual methods and has installed four sensors at each monitoring site to a depth of four feet with one sensor representing each foot of depth.

Producer periodically downloads continuously recorded soil moisture measurements that are used to schedule irrigation more effectively resulting in improved irrigation water managment and reduced energy use.

Scenario Feature Measure: Number of Measuring Sites

Scenario Unit: Each

Scenario Typical Size: 2

Scenario Cost: $3,248.16 **Scenario Cost/Unit:** $1,624.08

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$18.98	12	$227.76
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	$37.98	40	$1,519.20
Materials						
Soil Moisture Sensor	1456	Soil moisture resistance sensor W/10' cables. Equipment only.	Each	$34.24	8	$273.92
Data Logger	1453	Data Logger W/Graphic Output for water management. Materials only.	Each	$550.78	2	$1,101.56
Mobilization						
Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	$62.86	2	$125.72

Practice: 449 - Irrigation Water Management

Scenario: #9 - IWM Device w. Telemetry_YR1

Scenario Description:

This practice includes the installation of an Irrrigation Water Management device such as soil moisture sensors(tensiometers, gyp blocks, capacitance sensors etc), atmometers, water level sensors, etc, with a telemetry system to transmit continuous parameter data that can be utilized on tablets, smartphones, laptops, or personal computer and associated graphing software to evaluate various parameters to be used by the cooperator in improving irrigation water management in real time. Note: flowmeter (587) and surge valve (443) are separate practices and are not to be used as an IWM device under this practice.

The practice installation includes the purchase of IWM device, installation equipment (probe or auger), and a telemetry system to transmit continuous parameter data that can be utilized on an electronic device (tablet, smartphone, laptop, pc) and associated graphing software. Typical Scenario involves installation of resistance sensor blocks in a 80 acre field of irrigated cropland. Producer periodically monitors soil moisture sensors during the growing season.

Resource Concerns: Insufficient Water - Inefficient use of irrigation water, and Degraded Plant Condition - Undesirable plant productivity and health, and Inefficient Energy Use - Equipment and facilities.

Associated Practices: 449- Irrigation Water Management, 587-Structure for water Control, 328-Conservation Crop Rotation, and 590-Nutrient Management.

Before Situation:

In the typical scenario, producer uses manual methods to evaluate parameter, such as feel method to estimate soil moisture for scheduling irrigation.

After Situation:

In typical scenario, producer uses instrumentation with real-time, continuous telemetry in lieu of manual methods and has installed four sensors at each monitoring site to a depth of four feet with one sensor representing each foot of depth. Producer utilizes continuously transmitted soil moisture measurements in analysis software that are used to schedule irrigation more effectively resulting in improved irrigation water managment and reduced energy use.

Scenario Feature Measure: Number of Sensors in field

Scenario Unit: Each

Scenario Typical Size: 2

Scenario Cost: $4,091.58 **Scenario Cost/Unit:** $2,045.79

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$18.98	16	$303.68
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	$37.98	48	$1,823.04
Materials						
Data Logger with Telemetry System	1454	Data Logger W/Graphic Output for water management and telemetry - data communication device with power supply in a weather proof enclosure. Equipment only.	Each	$1,565.22	1	$1,565.22
Soil Moisture Sensor	1456	Soil moisture resistance sensor W/10' cables. Equipment only.	Each	$34.24	8	$273.92
Mobilization						
Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	$62.86	2	$125.72

Practice: 449 - Irrigation Water Management

Scenario: #10 - Rice Intermittent Flood All Season

Scenario Description:

Managing water levels in rice fields for the entire growing season to minimize greenhouse gas production according to an irrigation water management plan developed in cooperation with university and/or water district personnel. Typical irrigation water management will include managing water levels in the field to "dry down" between full flood conditions to a saturated soil condition prior to re-flooding the field. Records are kept for flooding operations. Irrigation return flows will be reduced also, decreasing groundwater demand and decreasing exports improving water quality. Energy use should alos be reduced.

Resource Concerns: Excessive Greenhouse Gas – CH4 (methane); Excessive Greenhouse Gas – CO2 (carbon dioxide) or Excessive Greenhouse Gas – N2O (nitrous oxide). Insufficient Water Supply-Inefficient use of irrigation water; and Inefficient Energy Use-Equipment and facilities.

Associated Practices: 410 - Grade Stablization Structure; 430 - Irrigation Pipeline; 464 - Irrigation Land Leveling; 443 - Irrigation System, Surface and Subsurface; 587-Structure for water Control; and 590-Nutrient Management.

Before Situation:

Farmer maintains continuous flood on rice fields during the growing season. Significant greenhouse gases are produced. Water and nutrients are lost if rainfall occurs during the growing season.

After Situation:

Farmer floods fields and allows the fields to "dry-down" until little of no water is standing in the field but the soil is maintained in a saturated condition. The fields are then re-flooded and the cycle is repeated throughout the growing season. Greenhouse gas production is reduced. Water and nutrients are conserved.

Scenario Feature Measure: Irrigated Acres Managed

Scenario Unit: Acre

Scenario Typical Size: 40

Scenario Cost: $1,478.08 **Scenario Cost/Unit:** $36.95

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hour	$27.22	25	$680.50
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	$37.98	21	$797.58

Practice: 449 - Irrigation Water Management

Scenario: #11 - Early Dry Down

Scenario Description:

Managing water levels in rice fields at the end of the growing season to minimize greenhouse gas production according to an irrigation water management plan developed in cooperation with university and/or water district personnel. Typical irrigation water management will include managing the field to an early "dry down" at the end of the growing season based on plant growth stage. Records are kept for end of season flooding operations. Irrigation return flows will be reduced also, decreasing groundwater demand and decreasing exports improving water quality. Energy use should alos be reduced.

Resource Concerns: Excessive Greenhouse Gas – CH4 (methane); Excessive Greenhouse Gas – CO2 (carbon dioxide) or Excessive Greenhouse Gas – N2O (nitrous oxide), Insufficient Water Supply-Inefficient use of irrigation water; and Inefficient Energy Use-Equipment and facilities.

Associated Practices: 410 - Grade Stablization Structure; 430 - Irrigation Pipeline; 464 - Irrigation Land Leveling; 443 - Irrigation System, Surface and Subsurface; 587-Structure for water Control; and 590-Nutrient Management.

Before Situation:

Farmer maintains continuous flood on rice fields during the growing season until rice is ready for harvest. Levees are cut and the fields are drained. Significant greenhouse gases are produced. Water and nutrients are lost if rainfall occurs during the growing season and at the end of the growing season.

After Situation:

Farmer floods fields and maintains flood during the growing season. Near the end of the growing season, no additional water is added and the field is allowed to dry down. Greenhouse gas production is reduced. Water and nutrients are conserved.

Scenario Feature Measure: Irrigated Acres Managed

Scenario Unit: Acre

Scenario Typical Size: 40

Scenario Cost: $706.44 **Scenario Cost/Unit:** $17.66

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Labor						
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	$37.98	10	$379.80
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hour	$27.22	12	$326.64